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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/612,063	07/01/2003	Donald J. Curry	117298	3496

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OLIFF & BERRIDGE, PLC  
P.O. BOX 19928  
ALEXANDRIA, VA 22320

EXAMINER
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TUCKER, WESLEY J

ART UNIT	PAPER NUMBER
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2624

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	03/08/2007	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

<b>Office Action Summary</b>	Application No.	Applicant(s)	
	10/612,063	CURRY ET AL.	
	Examiner	Art Unit	
	Wes Tucker	2624	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 01 July 2003.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-18 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 01 July 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>12-14-03, 5-12-04</u>   | 6) <input type="checkbox"/> Other: _____                          |

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 101***

35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

The USPTO "Interim Guidelines for Examination of Patent Applications for Patent Subject Matter Eligibility" (Official Gazette notice of 22 November 2005), Section IV.C, reads as follows:

While abstract ideas, natural phenomena, and laws of nature are not eligible for patenting, methods and products employing abstract ideas, natural phenomena, and laws of nature to perform a real-world function may well be. In evaluating whether a claim meets the requirements of section 101, the claim must be considered as a whole to determine whether it is for a particular application of an abstract idea, natural phenomenon, or law of nature, rather than for the abstract idea, natural phenomenon, or law of nature itself.

For claims including such excluded subject matter to be eligible, the claim must be for a practical application of the abstract idea, law of nature, or natural phenomenon. *Diehr*, 450 U.S. at 187, 209 USPQ at 8 ("application of a law of nature or mathematical formula to a known structure or process may well be deserving of patent protection."); *Benson*, 409 U.S. at 71, 175 USPQ at 676 (rejecting formula claim because it "has no substantial practical application").

To satisfy section 101 requirements, the claim must be for a practical application of the Sec. 101 judicial exception, which can be identified in various ways:

The claimed invention "transforms" an article or physical object to a different state or thing.

The claimed invention otherwise produces a useful, concrete and tangible result, based on the factors discussed below.

Claim(s) 1-18 is/are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter as follows. Claims 1, 9 and 15 each recite descriptive material in method and system claims. However, the program/algorithm itself merely manipulates data or an abstract idea, or merely solves a mathematical problem without a limitation to a practical application. A practical application exists if the result of the claimed invention is "useful, concrete and tangible" (with the emphasis

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on “result”)(Guidelines, section IV.C.2.b). A “useful” result is one that satisfies the utility requirement of section 101, a “concrete” result is one that is “repeatable” or “predictable”, and a “tangible” result is one that is “real”, or “real-world”, as opposed to “abstract” (Guidelines, section IV.C.2.b)). Claims 1, 9 and 15 merely manipulate data without ever producing a useful, concrete and tangible result. It is understood from the preamble that the invention is directed to eroding a gray image. However, from the single step or single means of the claims it is never explained how any useable output is determined. There is only a single step/means for subtracting a fixed value from the image. Then what? There is no explanation of what is output. Indeed the independent claims as worded recite no output and therefore no real tangible result outside of data manipulation. Appropriate correction is required.

In order to for the claimed product to produce a “useful, concrete and tangible” result, recitation of one or more of the following elements is suggested:

- The manipulation of data that represents a physical object or activity transformed from outside the computer.
- A physical transformation outside the computer, for example in the form of pre or post computer processing activity.
- A direct recitation of a practical application;

Applicant is also advised to provide a written explanation of how and why the claimed invention (either as currently recited or as amended) produces a useful, concrete and tangible result.

***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1 and 15 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential steps, such omission amounting to a gap between the steps. See MPEP § 2172.01. The omitted steps are: a neighborhood test for verification. The claims recite a single step of subtracting if a neighborhood test yields a certain result, but there is no recitation of that step in the claims and certainly no recitation of the verification step before the single step that is recited. Appropriate correction is required.

Claim 9, is a single means claim and is thus rejected under 35 U.S.C. 112 first paragraph. See MPEP 2164.08(a). A single means claim, i.e., where a means recitation does not appear in combination with another recited element of means, is subject to an undue breadth rejection under 35 U.S.C. 112, first paragraph. In re Hyatt, 708 F.2d 712, 714-715, 218 USPQ 195, 197 (Fed. Cir. 1983) (A single means claim which covered every conceivable means for achieving the stated purpose was held nonenabling for the scope of the claim because the specification disclosed at most only those means known to the inventor.). When claims depend on a recited property, a fact situation comparable to Hyatt is possible, where the claim covers every conceivable

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structure (means) for achieving the stated property (result) while the specification discloses at most only those known to the inventor.

Claim 9 recites a single means for subtracting. Appropriate correction is required. Furthermore the claim recites "comprising the step of: means for subtracting..." This makes no sense. There should be no steps in a system claim especially when followed by means for. Appropriate correction is required.

Claims 1-18 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In the independent claims 1, 9 and 15 it is unclear whether or not a neighborhood test is being performed or not as there is not step reciting that the test is performed. Furthermore it is unclear how the test operates to determine if features are broken in a binary image unless the image is actually binarized, and if there is binarization performed. Appropriate correction and explanation is required.

Claim 2 recites the limitation "the central pixel" and depends on claim 1. There is insufficient antecedent basis for this limitation in the claim. It is impossible to tell from the language of claims 1 and 2 what the "central pixel" refers to. Is the central pixel central to the gray image, the binary image, the thin feature or the neighborhood? It is unclear and lack antecedent basis. Furthermore the feature of converting from a

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foreground to background has no antecedent basis. There is no mention of this determination in the verification test recited in claim 1.

With regard to claim 3, it is unclear how templates match and what they match. Appropriate correction and explanation is required. It is also unclear how whether or not the test succeeds has any bearing on the conversion of the central pixel from foreground to background since the test succeeds in claims 1 and 2 under both conditions. Appropriate correction and explanation is required. Similar comments apply to claims 4 and 5

With regard to claim 6, it is unclear what "three strong background" and "one strong foreground" refers to. It is assumed that pixels are being referred to, but it is impossible to tell from the language of the claim.

With regard to claim 7, it is unclear where in a 3x3 kernel is being referred to as "two strong foreground in the middle of the sides of the opposite corner." As best can be determined this doesn't mean anything. Where exactly are the sides of the opposite corner and once that is determined where are the middle of those sides in a 3x3 matrix?

With regard to claim 8, it is unclear what the four orientations of the two 3x3 templates. Is that eight orientations in all? Is it two orientations for each template? What are the possible orientations of the templates? Are they inverted, flipped, or just

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rotated incrementally by 90 degrees. Appropriate correction and explanation is required.

Similar remarks apply to the remainder of the corresponding dependent claims 10-14 and 16-18. The claims recited in this application are replete with uncertain language and required immediate revision to be properly examined. Appropriate correction and explanation is required.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-4, 9-11 and 15 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent 5,859,921 to Suzuki.

With regard to claim 1, Suzuki discloses a method for thinning or eroding a gray image that preserves topological features when the gray image is binarized comprising the step of:

subtracting a fixed value from the gray image only if a neighborhood test verifies that the thinning/erosion does not break thin features in the resulting binary image



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(column 4, lines 43-67). Suzuki discloses calculating a value to subtract from a grey-scale image. Suzuki further discloses binarizing the image after optimal subtraction is calculated for the grey-scale image is calculated (column 5, lines 20-41). This is interpreted as the test.

With regard to claim 2, Suzuki discloses the method according to claim 1 where the test succeeds and the subtraction is performed if the central pixel would not be converted from a foreground to a background (column 4, line 53-column 5, line 5). Suzuki discloses using a neighborhood centered on a central pixel value. The operation is accordingly performed to determine the group of pixels in a black-level area, which is interpreted as a foreground area.

With regard to claim 3, Suzuki discloses the method according to claim 2 where the test also succeeds and the subtraction is performed if the central pixel would be converted from a foreground to a background and either of a plurality of templates match (column 6, lines 1-13). Suzuki discloses using face shape templates.

With regard to claim 4, Suzuki discloses the method according to claim 3 where two templates are used (column 6, lines 44-65). Suzuki determines candidate eye areas.

With regard to claim 9, Suzuki discloses a system for thinning or eroding a gray image that preserves topological features when the gray image is binarized comprising the step of:

means for subtracting a fixed value from the gray image only if a neighborhood test verifies that the thinning/erosion does not break thin features in the resulting binary image (column 4, lines 43-67). Suzuki discloses calculating a value to subtract from a grey-scale image. Suzuki further discloses binarizing the image after optimal subtraction is calculated for the grey-scale image is calculated (column 5, lines 20-41). This is interpreted as the test.

With regard to claim 10, the discussion of claim 2 applies.

With regard to claim 11, the discussion of claim 3 applies.

With regard to claim 15, the discussions of claims 1, 2 and 3 apply respectively.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 5-8, 12-14 and 16-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of U.S. Patents 5,859,921 to Suzuki and 4,949,390 to Iverson et al.

With regard to claim 5, Suzuki discloses the method according to claim 3 where templates are used but does not expressly disclose that the templates are 3x3. Iverson discloses the use of different kinds of 3x3 templates for use in determining appropriate thinning procedures (column 2, lines 25-57 and Figs. 7 and 8). Iverson teaches that the thinning determination is valuable in detecting errors in electronic artwork but that it would of course be useful in application to other types of image enhancement that use binary neighborhood transformations (column 2, lines 50-57). Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to use the templates of Iverson to detect thinning and trimming conditions in combination with Suzuki's thinning and binarization operations to detect errors and compensate the thinning procedures.

With regard to claim 6, Suzuki discloses the method according to claim 3 but does not disclose where one template consists of three strong background along one side and one strong foreground in the middle of the opposite side. Iverson discloses wherein one template consists of three strong background along one side and one

strong foreground in the middle of the opposite side (Fig. 7, bottom left template). The same discussion applies with regard to claim 5 for combining the use of 3x3 templates.

With regard to claim 7, Suzuki discloses where one template consists of three strong background in one corner and two strong foreground in the middle of the sides of the opposite corner (Fig. 7, top, second from right template).

With regard to claim 8, Iverson discloses wherein the test is performed by comparing a 3x3 window with all four orientations of the two templates (Figs. 7 and 8).

With regard to claim 12, the discussion of claim 6 applies.

With regard to claim 13, the discussion of claim 7 applies.

With regard to claim 14, the discussion of claim 8 applies.

With regard to claim 16, the discussion of claim 6 applies.

With regard to claim 17, the discussion of claim 7 applies.

With regard to claim 18, the discussion of claim 8 applies.

**Contact Information**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Wes Tucker whose telephone number is 571-272-7427. The examiner can normally be reached on 9AM-5PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matt Bella can be reached on 571-272-7778. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Wes Tucker

2-26-07



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